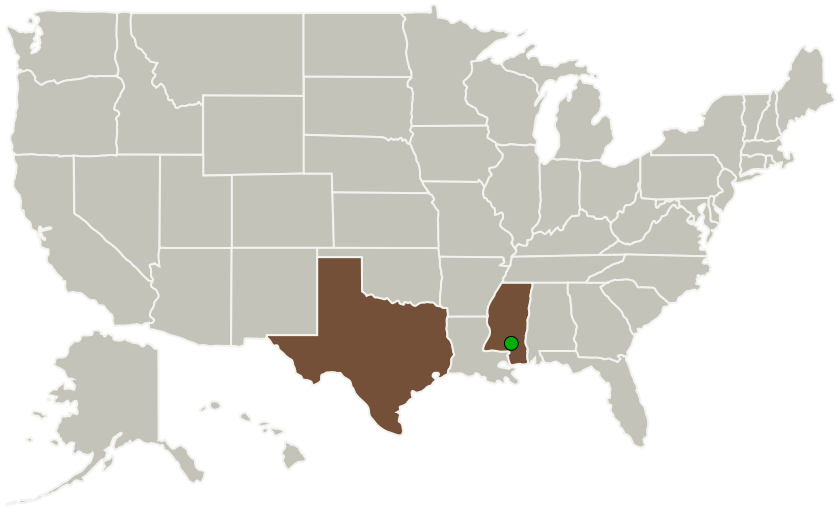
Heat Harvesting by Artificial Muscles, Phase II

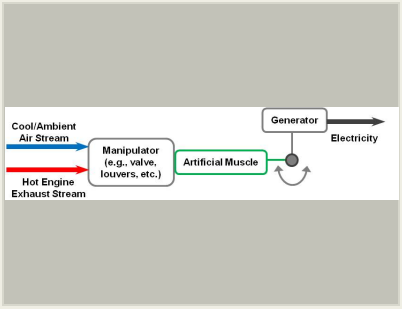
Completed Technology Project (2015 - 2017)

Project Introduction

NASA emphasizes the need to implement energy harvesting in its future mission activities, as well as to conserve on energy and to enhance the sustainability of NASA's facilities. By harvesting energy from the ambient surroundings, there is less dependence on a primary power supply (e.g., combustion engines, fuel cells, batteries, solar cells, etc., and even AC electricity for ground applications), and a possibility for independent operation of assorted electronic and mechanical devices, including remote and wireless sensors. Differential heat sources are very abundant, both in ground and space scenarios. For this STTR application, Lynntech has teamed up with Dr. Ray Baughman (Director of NanoTech Institute, University of Texas at Dallas) to pioneer the use of artificial muscles (also known as coiled polymer actuators) as an advanced method for energy harvesting. The proposed innovative technology for efficient capture and conversion of thermal energy is very versatile: it can convert heat into mechanical and electrical energy, and it can heat harvest under typical ambient environments, under high intensity energy environments (as found in propulsion testing and launch facilities), and under cryogenic temperatures. Therefore, the proposed technology can be adapted for use in multiple space and ground applications for heat capture and conversion.

Primary U.S. Work Locations and Key Partners





Heat Harvesting by Artificial Muscles Project Image

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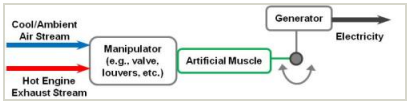
Organizations Performing Work	Role	Type	Location
Lynntech, Inc.	Lead Organization	Industry	College Station, Texas
Stennis Space Center(SSC)	Supporting Organization	NASA Center	Stennis Space Center, Mississippi
The University of Texas at Dallas	Supporting Organization	Academia	Richardson, Texas

Primary U.S. Work Locations	
Mississippi	Texas

Images



Project Image
Heat Harvesting by Artificial Muscles Project Image
(https://techport.nasa.gov/image/132962)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Lynntech, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Anuncia Gonzalez-martin

Co-Investigator:
Anuncia Gonzalez-martin

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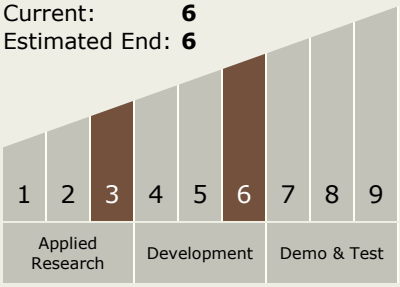
Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.4 Dynamic Energy Conversion

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System